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The Strong, the Weak, and the Unbalanced: The Link Between Tie Strength and Cyberaggression on a Social Network Site

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Abstract

The subject of this research is hurtful behavior on social network sites. Specifically, the study examines how young people's connections on such sites are related to their risk of being involved in cyberharassment and cyberbullying. For this purpose, eighth-grade students from 11 secondary schools were surveyed ($n = 1{,}458$). The students indicated who their friends were at school and with whom they were connected on Facebook. The results demonstrate that victimization and perpetration are linked to the composition of one's network of online connections. The presence of many connections with fellow students who are not friends elevates the risk of cyberharassment and cyberbullying. In addition, perpetrators and victims have a disproportionally high number of connections based on unbalanced, weak friendships. This lack of balance may indicate that perpetrators are higher in the hierarchy of social status and that victims are lower. The findings imply that adolescents may be able to avert online victimization by carefully selecting their online ties. Further implications for the prevention of harassment and bullying on social network sites as well as avenues for future research are discussed.

Keywords

social network site, online harassment, online bullying, status imbalance, friendship, adolescents

Introduction

Social network sites have become popular platforms for young adolescents to manage their social relationships and to define their identities (Boyd & Ellison, 2007; Livingstone, 2008; Valkenburg, Peter, & Schouten, 2006). At an age when friends and peer social contacts become increasingly

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important (Brown, 2004), social network sites provide an excellent tool to display one's connections and to communicate with peers (Livingstone, 2008). These interactions create many positive opportunities, including opportunities for friendship development, identity formation, information seeking, and political participation (Boyd, 2007; Ellison, Steinfield, & Lampe, 2011; Yun & Chang, 2011). However, social network sites also give rise to negative experiences that are the result of aggressive behavior, such as harassment and electronic forms of bullying (Kite, Gable, & Filippelli, 2010; Livingstone, 2008; Ybarra & Mitchell, 2008). Both are types of cyberaggression, which is intentionally harmful behavior delivered through electronic means (Grigg, 2010). The difference between cyberharassment and cyberbullying is that the latter explicitly assumes a power imbalance between the victim and the perpetrator. This implies that victims of cyberbullying have difficulty defending themselves and that the same patterns of bullying are repeated over time (Sijtsema, Veenstra, Lindenberg, & Salmivalli, 2009; Vandebosch & Van Cleemput, 2008; Ybarra & Mitchell, 2004). As a popular platform, social network sites are a common venue for acts of cyberaggression (Kwan & Skoric, 2013; Livingstone, Haddon, Görzig, & Olafsson, 2011; Ybarra & Mitchell, 2008). In a large-scale European study, for instance, 6% of the sampled youth indicated being cyberbullied recently, with half of them reporting bullying "on a social network site" (Livingstone et al., 2011). This victimization has been shown to influence social well-being and psychological health (Mitchell, Finkelhor, & Wolak, 2001; Staude-Müller, Hansen, & Voss, 2012; Ybarra, 2004).

It is important to develop a greater understanding of the factors that lead to aggressive behavior on social network sites. Thus far, research has identified a limited number of characteristics that are associated with participation in this type of behavior: offline involvement in bullying, intensive and frequent use of social network sites, and risky behavior on these sites, such as accepting friendship requests from strangers (Kwan & Skoric, 2013; Sengupta & Chaudhuri, 2011). However, researchers have not yet studied how the number and the quality of people's connections on social network sites are related to involvement in cyberaggression. This constitutes a social network approach, which focuses on a network of social ties (such as online connections) to explain individual characteristics (such as involvement in cyberaggression). In this regard, this approach differs from traditional social research, which focuses on individual properties as a basis for explanation (Borgatti, Mehra, Brass, & Labianca, 2009). Social network analysis has yielded explanations for a variety of social phenomena (Borgatti et al., 2009) and has proven essential in understanding traditional bullying behavior (Salmivalli, 2010; Salmivalli, Huttunen, & Lagerspetz, 1997; Sijtsema et al., 2009). For instance, the position of individuals in the network of peer relationships has been found to affect their role in bullying; perpetrators have more friends and are perceived as being popular, whereas victims are more likely to be rejected and have fewer friends (Mouttapa, Valente, Gallaher, Rohrbach, & Unger, 2004; Salmivalli, 2010).

To advance the study of cyberaggression, the present research employs the online network as a central component and examines how the presence of online ties of a certain strength is associated with the victimization and the perpetration of cyberharassment and cyberbullying. For this purpose, the social relationships of young adolescents and their connections on a social network site will be mapped in the context of an existing (offline) population. This study focuses on Facebook because it is currently the most popular social network site (Yang & Brown, 2013).

The Strengths of Facebook Friendships

The notion of tie strength has been introduced to distinguish between network connections of different degrees of strength (Granovetter, 1973). The strength of a tie can be described as a combination of "the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterize the tie" (Granovetter, 1973, p. 1361). Based on these criteria, a range of different tie strengths can be identified. Nevertheless, the literature tends to broadly

distinguish between strong ties and weak ties. Strong ties are characterized by higher levels of trust, support, and intimacy compared with their weaker counterparts (Ellison, Vitak, Gray, & Lampe, 2014). They tend to "bond" the members of homogeneous and tightly knit groups together (Putnam, 2000). In contrast, weak ties are part of an individual's bridging social capital—the type of ties that can transgress the borders of certain social groups and allow connections with others who live in different circles (Putnam, 2000). Both strong ties and weak ties are useful because they provide access to different types of resources (Haythornthwaite, 2002). Strongly tied peers, for instance, have greater motivation for assistance, are readily available, and provide access to information known by the group (Granovetter, 1973; Haythornthwaite, 2002). Weak ties provide diverse perspectives as well as novel information and resources (Ellison et al., 2014; Haythornthwaite, 2002), which offer important benefits, such as better jobs or faster promotions (Borgatti et al., 2009).

In the context of a social network site, the strength of online connections (such as Facebook "friendships") is difficult to determine. Friendships on Facebook capture a diverse set of social relationships, including family members, school friends, classmates, and acquaintances (Vitak, Ellison, & Steinfield, 2011; Zhang & Leung, 2014). Hence, being friends on Facebook does not necessarily signify friendship as young people would define it in their daily lives (Boyd & Ellison, 2007). Instead, adolescents connect with a diverse set of peers on social network sites, ranging from "very good friends" to "no friends" (Van Cleemput, 2010). Therefore, teenagers acquire both bonding social capital (strong ties) and bridging social capital (weak ties) on Facebook (J. Ahn, 2012). The finding that Facebook connections are diverse in strength makes it difficult to estimate the value of Facebook relationships. A second challenge in studying Facebook networks is that all connections are reciprocated. Friendship connections are created by sending a request to others who become friends when they accept (West, Lewis, & Currie, 2009).

To overcome the difficulties in assessing the strength of online connections, various solutions have been applied. One approach is to automatically collect a respondent's Facebook connections, randomly select a number of ties, and enquire about the strength of the relationship with these ties (Gilbert & Karahalios, 2009) or the psychological closeness with them (Sosik & Bazarova, 2014). Another method of assessing the strength of Facebook connections is to differentiate between "all Facebook friends" and the subset of Facebook connections that respondents would consider "actual friends," as in Ellison, Steinfield, and Lampe (2011). This study bears resemblance to the latter approach because it departs from everyday social relationships to assess the strength of connections on a social network site. More specifically, it categorizes Facebook connections based on the respondents' everyday friendship relationships with these ties. For instance, a Facebook connection that the respondent considers a "best friend" is deemed stronger than a Facebook connection that is not a friend in everyday life. This interface of everyday friendship networks and online networks is used to explain bullying and harassment on Facebook.

There are multiple reasons for studying Facebook connections from the perspective of traditional friendship within a certain community. First, the use of social network sites by adolescents is closely linked to their everyday social environment (Boyd, 2007) and is primarily used to connect with others who share "in-person" relationships (Ellison et al., 2011; Mesch, 2010). Hence, young people are highly likely to share friendship relationships with the peers with whom they are connected on Facebook. Second, friendship (and social capital, by extension) is the most frequently studied topic in social network research (see, for instance, the work of Coleman, 1980, or Putnam, 2000). It is therefore appropriate to investigate novel types of (online) friendship ties from the perspective of traditional friendship measures that have proven effective. Third, the study of friendship networks within a bounded population has generated valuable insights, most notably insights into harassment and bullying. For instance, it was found that bullies (and their assistants) have a larger friendship network compared to victims or outsiders (Salmivalli et al., 1997) and that victimization by certain types of aggression leads to undesirability as a friend (Sijtsema, Rambaran, & Ojanen, 2013).

Table 1. Evaluated Closeness and Reciprocity of Social Ties and Corresponding Balance.

Evaluated Closeness Ego	Evaluated Closeness Alter	Balance
(No tie)	(No tie)	No tie exists
Close	Close	Balanced (same closeness evaluation)
Less close	Less close	
Close	Less close	Unbalanced and ego evaluates as closer
Close	(No tie)	
Less close	(No tie)	
Less close	Close	Unbalanced and ego evaluates as less close
(No tie)	Close	
(No tie)	Less close	

Moreover, it has been demonstrated that tie strength matters: High-quality and close friendships reduce involvement in victimization and perpetration (Adams, Bukowski, & Bagwell, 2005; Bollmer, Milich, Harris, & Maras, 2005). For the construction of hypotheses (see the fourth section), additional research in this field is discussed.

Imbalances in Friendship Ties

The definition of tie strength refers to both the ''closeness'' of a tie (intensity and intimacy) and the ''reciprocity'' of ties (mutual confining and reciprocal services; Granovetter, 1973). Therefore, both notions have been used to describe the strengths of network ties (Davis, 1970; Marsden & Campbell, 1984; Mazur, 1971). Research that focuses on the *closeness* of ties as an indication of strength asks respondents to ''nominate'' their ties and to classify them in different categories (Marsden & Campbell, 1984). The exact categories are defined by the study, but common classifications include best friends, good (or close) friends, and acquaintances (Marsden & Campbell, 1984; Miczo, Mariani, & Donahue, 2011; Sias & Cahill, 1998). This means of measuring the strength of social relationships is based on the personal judgment by a respondent (ego) of their ties and does not consider the evaluation of the actor who is nominated (alter). Other research has considered *reciprocity* to be an important feature of tie strength. From this perspective, mutually acknowledged friendships are characteristics of strong ties (Davis, 1970; Mazur, 1971; Mercken, Snijders, Steglich, Vartianian, & de Vries, 2010; Vaquera & Kao, 2008).

Although the concepts of closeness and reciprocity may be presented as distinct characteristics, they are nevertheless related. Researchers have proposed that the closeness of social ties and their reciprocity are intertwined and can be combined for a more elaborate analysis (Faris & Ennett, 2012; Friedkin, 1990). Two actors may acknowledge their friendship, which indicates reciprocity, but one actor may also evaluate the friendship as being closer compared with the other actor, thus revealing a difference in terms of closeness (Faris & Ennett, 2012). This difference has been acknowledged and incorporated into the methodology of prior research (Adams et al., 2005). This study applies a similar categorization and elaborates on the interplay between reciprocity and closeness. Ties that are reciprocated and evaluated as equally close are labeled as balanced, whereas ties that are either not reciprocated or evaluated as differing in strength are classified as unbalanced. Table 1 provides an overview of the full range of possibilities. In the top case, the actors have no social relationship. The next two cases concern friendship ties that are mutually acknowledged and are evaluated as equal in strength (balanced). The bottom six cases are friendships that are either not reciprocated or reciprocated with differences in the evaluation of closeness (unbalanced).

Imbalance and the Relationship With Social Status

Before elaborating on the link between unbalanced friendship and social status, the latter concept is further explored. At the onset of adolescence, social status takes a more prominent role, with young people becoming more concerned with their reputation and position in the peer hierarchy (Brown & Braun, 2013). Two indicators of social status are most often used: sociometric popularity and perceived popularity (H.-J. Ahn, Garandeau, & Rodkin, 2010; Mayeux, Houser, & Dyches, 2011). The former captures the extent to which individuals are socially accepted and liked by the peer group (H.-J. Ahn et al., 2010). The latter is concerned with the perception of being "popular" in the peer group—that is, the social impact of individuals and their visibility in the group (Cillessen, Mayeux, Ha, de Bruyn, & LaFontana, 2014). In the context of Facebook, online connections may capture both types of social status. In terms of sociometric popularity, having an extensive offline friendship network has been shown to contribute to being more connected in online (Facebook) networks (Yang & Brown, 2013; Zhang & Leung, 2014). For perceived popularity, Facebook members with a higher number of connections are considered more popular (although the effect reverses with an abundance of connections; Tong, Van Der Heide, Langwell, & Walther, 2008). Although the total number of Facebook connections can provide a broad clue to social status, diversity in the nature and strength of Facebook ties is also evident (see the second section). Therefore, this study addresses both the number of online connections (quantity) and the strength of online ties (quality). For the latter, the distinction between balanced and unbalanced ties contributes to understanding social status.

Research has shown that imbalances in social ties are indicative of social status differences; one-sided nominations tend to originate from individuals who are lower in a hierarchy to others who are at higher levels (Davis & Leinhardt, 1972; Hallinan, 1978). Recently, evidence of this pattern has been found in young adolescent populations. Ball and Newman (2013) inferred such a hierarchy in a friendship network of young adolescents aged 12–18 and argued that this ranking reflected a measure of social status. Lower status individuals may claim unreciprocated friendships with higher status individuals, whereas higher status individuals are on the receiving end of these nominations (Ball & Newman, 2013). In a similar population of schoolchildren, evidence of a hierarchy was found in that higher status individuals did not unilaterally nominate lower status peers as friends (Sijtsema et al., 2010). Rather, higher status adolescents tended to develop antipathy toward lower popularity peers (Berger & Dijkstra, 2013). These results suggest that unbalanced relationships in the lower segment of Table 1 indicate a status difference in favor of the nominator (the ego indicates a weaker tie compared with the alter) or in favor of the nominee (the ego indicates a stronger tie compared with the alter). This social status and the associated tie strength may be essential for understanding aggressive behavior in the context of Facebook.

The Strength of Ties as a Predictor of Aggressive Interactions

Aggressive Behavior in Unbalanced Friendships

Dominance theory, which implies that aggression is used against others who are weaker to gain status among peers (Mouttapa et al., 2004), suggests that aggressive behavior tends to occur in interactions between a higher status perpetrator and a lower status victim. This pattern arises because lower status individuals are less likely to be defended by peers (Schäfer, Korn, Brodbeck, Wolke, & Schulz, 2005) and because bullying lower status targets minimizes the risk of receiving negative reactions from significant others (Veenstra, Lindenberg, Munniksma, & Dijkstra, 2010). Research on bullying and aggression supports the expectation of high-status perpetrators and low-status victims within certain populations (Graham & Bellmore, 2007; Mayeux et al., 2011; Olthof, Goossens, Vermande, Aleva, & van der Meulen, 2011; Salmivalli & Isaacs, 2005). As Faris and Felmlee (2011) note, the power of perpetrators to use aggression is rooted in their social status among peers.

If we translate this finding into the context of aggressive behavior on Facebook, it is expected that (1) adolescents with a low-status profile are more likely to be victims and (2) those with a high-status profile are more likely to be perpetrators. The first aspect implies that victims have a higher number of unbalanced Facebook ties in which they claim unreciprocated friendships. That is, victims claim to be friends with their Facebook connections, but these connections attach little value to their relationship with the victim. Hence, victims may not rely on their peers to support them or provide help in case of aggression (Macháčková, Dedkova, Sevcikova, & Cerna, 2013). The second expected outcome is that perpetrators have many Facebook connections who "look up to them" and who would like to associate with those higher in the social hierarchy. Such online contacts could support the aggressor, for instance, by sharing aggressive messages or adding supportive comments. To study whether the expected patterns arise, attention should focus on the types of ties that adolescents have online. In particular, online connections with an underlying friendship imbalance can provide essential clues about the social position of Facebook users and their likelihood of involvement in cyberaggression. Thus, we expect that the presence of many Facebook friends that the ego evaluates as closer than the alter increases the likelihood of being a victim (Hypothesis 1a) and decreases the likelihood of being a perpetrator (Hypothesis 1b). The opposite pattern is also expected: Having many Facebook connections that the ego evaluates as less close than the alter decreases the likelihood of being victimized (Hypothesis 2a) and increases the likelihood of perpetration (Hypothesis 2b).

Hypothesis 1: The number of Facebook connections that the ego evaluates as closer than the alter is (a) positively related to the likelihood of victimization and (b) negatively related to the likelihood of perpetrating aggressive behavior.

Hypothesis 2: The number of Facebook connections that the ego evaluates as less close than the alter is (a) negatively related to the likelihood of victimization and (b) positively related to the likelihood of perpetrating aggressive behavior.

Aggressive Behavior and Balanced Ties

In addition to the patterns of unbalanced ties, the number of close, reciprocated ties may be related to involvement in cyberaggression. Strong and stable interpersonal relationships are essential to the development of social belonging and emotional well-being (Baumeister & Leary, 1995). Therefore, it is expected that a lack of such ties increases the likelihood of both perpetration and victimization. With regard to perpetration, poor friendship quality may result in aggressive behavior. As argued by Adams, Bukowski, and Bagwell (2005), the absence of close relationships can provoke negative affections, which can lead to aggressive reactions. Additionally, the personal traits of perpetrators may hinder relationship development. Individuals who attach great value to dominance goals and status competition may have higher levels of conflict and lower intimacy in their friendships (Ojanen, Sijtsema, & Rambaran, 2013). Concurring outcomes have been found for traditional aggression in early adolescence; stable aggressive behavior has been found to be associated with a lower number of reciprocated best friendship relationships (Adams et al., 2005). Although these findings show that aggressors have fewer close friendships, they do not exclude the possibility that perpetrators can be a part of relatively large friendship cliques, as Salmivalli, Huttunen, and Lagerspetz (1997) have found. Such peer-assessed friendship clusters may mainly consist of peers who like to spend time with perpetrators rather than those who are engaged in close relationships with them. In terms of victimization, the targets of aggressive acts tend to have a lower number of close, reciprocated ties compared to their peers. First, youngsters with high-quality friendships are protected from aggression because others are willing to defend them (Bollmer et al., 2005; Hodges, Boivin, Vitaro, & Bukowski, 1999). Second, victimized adolescents may also have difficulties retaining close

friends because victimization may lead to tensions in best friendship ties. Research has shown that victims report more frequent conflicts with their best friends (Champion, Vernberg, & Shipman, 2003). Because close friendship is negatively associated with offline victimization and perpetration (Adams et al., 2005; Bollmer et al., 2005), it is hypothesized that people who have few mutually acknowledged close friendship ties on Facebook are more likely to be involved in aggressive behavior as a victim (Hypothesis 3a) and as a perpetrator (Hypothesis 3b).

Hypothesis 3: The number of Facebook friends with balanced close ties is negatively related to the likelihood of (a) victimization and (b) perpetration of aggressive behavior.

In addition to the expected risk-increasing role of mutually unacknowledged relationships and associated differences in closeness evaluation (Hypotheses 1 and 2) as well as the expected protective role of strong friendships (Hypothesis 3), two types of weaker relationships exist. The first type of Facebook friendship consists of people who indicate no underlying friendship relationship but who are connected on Facebook. This type likely includes individuals who would consider one another ''acquaintances'' in real life—that is, individuals who are familiar with but not close to one another (Boyd, 2006). The second type of Facebook friendship includes relationships among people who mutually acknowledge underlying ties that are less close, such as lower quality friendships. These actors would not value these relationships as highly as close ties, but the lower quality tie is mutually acknowledged (balanced).

The likelihood of aggressive interactions on a social network site may increase with a large number of the aforementioned types of Facebook friends. The presence of many weak Facebook connections may lead to increased exposure to hurtful actions because aggression is directed toward out-groups rather than toward the in-group (Gini, 2006) and because weak ties connect different subgroups of friends (Granovetter, 1973). Two empirical findings support this possibility. First, it has been shown that intensive use of Facebook is associated with both an increase in bridging social capital (weak ties; Ellison, Steinfield, & Lampe, 2007) and heightened involvement in bullying via Facebook (Kwan & Skoric, 2013). Second, studies of cyberbullying have indicated that same-grade peers (weak ties) are the most common source of bullying actions and are more common than the subgroup that is considered ''friends'' (Kowalski & Limber, 2007; Smith et al., 2008). As a counterargument, studies have also found disagreement and conflict to be more common among children and their friends than among children and their acquaintances (Hartup & French, 1993). However, whether these conflicts lead to behavior that is truly aggressive or hurtful remains unclear. Therefore, it is hypothesized that online victimization and perpetration are associated with a higher number of Facebook-only ties (Hypotheses 4a and 4b) and ties based on balanced friendships that are less close (Hypotheses 5a and 5b).

Hypothesis 4: The number of Facebook-only friends is positively related to the likelihood of (a) victimization and (b) perpetration of aggressive behavior.

Hypothesis 5: The number of Facebook friends with balanced ties that are less close is positively related to the likelihood of (a) victimization and (b) perpetration of aggressive behavior.

Method

Sample and Procedure

The school environment was chosen to collect data on young people's Facebook connections and the aggressive behavior that occurs on this social network site. Schools are the focus of this study because for early adolescents, fellow students constitute the most important source of both positive

and negative online social interactions (Boneva, Quinn, Kraut, Kiesler, & Shklovski, 2006; Boyd, 2010; Juvonen & Gross, 2008; Slonje & Smith, 2008). More specifically, cyberaggression is studied in the context of eighth-grade populations in multiple secondary schools. First, the selection of bounded, entire grade populations allowed for the assessment of how the grade members mutually evaluate their social relationships. Second, the eighth grade was chosen because electronic forms of bullying have been found to peak at that stage of life (Tokunaga, 2010; Williams & Guerra, 2007). Schools were sampled in the region of Antwerp, Belgium, and were selected based on their size and type of education. Preference was given to larger schools and schools that featured vocational education because cyberbullying has been found to be more prevalent in vocational educational settings (Walrave & Heirman, 2011). The final sample included 11 secondary schools that participated in the study (five selected schools declined to take part). In total, 1,458 students completed the survey (92% of the eighth-grade students in participating schools); 60.2% were boys and 67.4% were 13 or 14 years old at the end of the data collection. The eighth grades in the participating schools had 133 students on average (standard deviation [*SD*] = 72.04), with the largest grade containing 263 students and the smallest containing 29. To study aggressive behavior and contacts on Facebook, only students who had a profile on Facebook (and who had at least one Facebook friend) were included in the analyses (84.3% of the participants, 1,229 respondents).

A paper-and-pencil survey was completed during school hours on the school premises. Each questionnaire featured a unique identification number, which allowed the researchers to connect the respondents to their nominations of Facebook friends and social relationships. In this manner, networks of friendships and Facebook contacts could be reconstructed. Before beginning the survey, the students received information regarding the research and instructions on completing the questionnaire. The respondents sat separately and worked on the survey privately. During the process of completing the survey, the participants were able to ask for clarification from the researcher.

Ethical issues were considered in the various phases of this study. Before the data collection, the network approach to cyberaggression among adolescents was approved by the review board of the project's funding institution, which seeks advice from internal and external reviewers. In preparation for the collection, the staff members at the selected schools were provided with information regarding the study and were asked to cooperate. Participating schools delivered an informational letter describing the research to the students, and (passive) consent was obtained from their parents. At the time of data collection, the information regarding the study design was repeated in the oral introduction. In the instructions, the respondents were guaranteed absolute confidentiality in processing their data; that is, they were assured that their individual answers would never be available to any person other than the researchers. Furthermore, all survey copies featured a separate sheet that contained information regarding safe Internet use and what to do when harassment or bullying is experienced. Following the data collection, the schools that cooperated in the research were provided with a report on the prevalence and characteristics of online harassment and bullying at their schools. These results were based on grade-level data without reference to individual students or classes.

Measures

Social relationships. The respondents evaluated social ties through nomination questions that are commonly used in research on traditional harassment and bullying (Faris & Ennett, 2012; Neal, 2007; Sijtsema et al., 2009). To measure the closeness of friendship ties, the students wrote the names of their "best friends" (close relationship) and the names of people who were "just friends" (less close relationship). Best friends were defined as "people you hang out with a lot, whom you talk about very personal things with, and whom you can count on." Others who were just friends were described as "people whom you regularly hang out with and chat with (but less often than with your best friends and less about really personal things)." For each of these two questions, the respondents

Table 2. Hypothesized Associations Between the Number of Facebook Ties of Different Strengths (Based on the Underlying Relationship) and the Likelihood of Victimization and Perpetration.

Evaluated Closeness Ego	Evaluated Closeness Alter	Underlying Balance	Likelihood of Ego's Involvement With Many of These Facebook Ties	
			Victimization	Perpetration
(No tie)	(No tie)	No tie exists	Higher (Hypothesis 4a)	Higher (Hypothesis 4b)
Close	Close	Balanced (same closeness evaluation)	Lower (Hypothesis 3a)	Lower (Hypothesis 3b)
Less close	Less close		Higher (Hypothesis 5a)	Higher (Hypothesis 5b)
Close	Less close	Unbalanced and ego evaluates as closer	Higher (Hypothesis 1a)	Lower (Hypothesis 1b)
Close	(No tie)			
Less close	(No tie)			
Less close	Close	Unbalanced and alter evaluates as closer	Lower (Hypothesis 2a)	Higher (Hypothesis 2b)
(No tie)	Close			
(No tie)	Less close			

wrote the first and last names of up to eight same-grade students (see Appendix A). As a reference for completing these questions, a list featuring the names of all same-grade students was added to the survey. If a respondent nominated the same student as both a "best friend" and "just a friend," the latter nomination was discarded.

Facebook friendships. To measure who was friends with whom on Facebook, the students who reported having a profile on this network site indicated their same-grade Facebook connections. The question about Facebook connections was framed in the context of Facebook use, which was assessed in a different section of the questionnaire than everyday social relationships to minimize potential contamination between the offline and online peer nomination items. Additionally, because the number of Facebook friends may be large, the nominations were made by ticking checkboxes next to the names of same-grade students on the reference list (see Appendix C). Facebook friendship between two students was assumed when either of them indicated being connected to the other. Although Facebook connections are always mutual, students may not remember exactly with whom they are friends on this social network site. Using the Facebook network and the underlying social relationships, the students' online connections were classified based on their strength (see Table 2 for an overview of the nine categories). The resulting variables were individual-level measurements that represent the number of Facebook friends in each category. Thus, when two respondents were connected on Facebook, the tie was counted in one of the nine categories for both actors.

Cyberaggression. Harassment on Facebook was measured by presenting the respondents with five instances of potentially hurtful behavior and asking whether (same-grade) students had targeted them with such actions during the last 6 months (see Appendix D). When the answer to this question was affirmative, the respondents nominated up to three perpetrators from the same grade for every item. The items were framed with the respondent as a victim and consisted of the following cases: (1) "Saying something rude to me through a private message on Facebook," (2) "Excluding me from a Facebook group or removing me as a friend," (3) "Posting a comment that wasn't nice on my pictures or messages on Facebook," (4) "Placing things on my 'wall' that were not nice at all," and (5) "Placing a picture of me on Facebook and writing mean things next to it."

In addition to the harassment measure, bullying on Facebook was directly assessed (see Appendix B). The respondents read a description of bullying, which was based on the criteria defined by Olweus (1993). Bullying was described as "doing or saying hurtful things" with the intention to

make others feel bad and with targets having difficulty defending themselves. It was further clarified that bullying does not involve friends teasing each other or arguing. Following this description, the students reported their involvement in bullying "through the Internet or mobile phone" during the last 6 months. The students indicated the frequency of victimization on a 5-point scale (never to multiple times a month) and selected the perpetrators' origin (same grade, different grade, out-of-school, Internet-only, and unknown). If same-grade students were involved, the victims nominated up to four perpetrators by writing their names and the application that was used for cyberbullying. The latter was used to measure cyberbullying by means of Facebook.

Dichotomous measures of involvement in cyberharassment and cyberbullying on Facebook were calculated based on the victims' accounts, where giving nominations indicated victimization and receiving nominations indicated perpetration. The victim's perspective was adopted to determine who was a target and who was an offender as a means of adopting a consistent (and likely reliable) account of aggressive behavior (as in Huitsing, Veenstra, Sainio, & Salmivalli, 2012).

Analyses

Univariate descriptives of involvement in cyberaggression and the strength of Facebook ties are reported. For the multivariate analyses, logistic regression models were constructed using the measures of (same-grade) victimization and perpetration as the dependent variables. The independent variables in all analyses were the number of Facebook ties of different underlying strengths. Hence, the predictor variables in the logistic regression analysis were derived from the social network data, as in Mouttapa, Valente, Gallaher, Rohrbach, and Unger (2004). Analyses were performed to check for potential multicollinearity issues. No problematic correlations were found, with a maximum variance inflation factor of 1.31, which is far below the threshold for concern of 10 (Myers, 1990).

Results

Descriptives

Regarding the prevalence of aggressive behavior by same-grade peers, the number of victims and perpetrators varied between the different forms of harassment and bullying. The prevalence figures are provided as a percentage of the total number of respondents that had a Facebook profile with at least one same-grade connection ($n = 1{,}229$). Receiving rude private messages from same-grade students on Facebook was most common, with 5.3% of the students having experienced this behavior during the previous 6 months. Receiving malicious comments on Facebook pictures or messages by same-grade peers was indicated by 4.2% of the students. The other forms of cyberharassment were less common: exclusion on Facebook or removal as a friend (2%), being subjected to mean postings on one's public Facebook "wall" (0.9%), and victimization through pictures with mean comments (0.3%). Because sending rude messages and posting mean comments were the most common behaviors, further analysis will focus on these two types of cyberharassment. With regard to cyberbullying, 3.5% of respondents with a Facebook profile reported being subjected to bullying by same-grade offenders on Facebook. The victims' nominations were used to assess which students were involved as perpetrators. Most victims indicated that perpetrators were involved in forms of cyberharassment such as sending hurtful private messages (5.9%) and posting unpleasant public comments (4.7%) on Facebook. For cyberbullying, 4.1% of the respondents were reported to commit this behavior on Facebook. Significant correlations were found between the perpetration and victimization of harassment through private messages ($r = .14$) and between Facebook bullying and the three forms of victimization: receiving rude private messages ($r = .19$), receiving hurtful comments ($r = .10$), and being bullied on Facebook ($r = .07$).

Table 3. The Number of Facebook Ties of Different Underlying Tie Strengths.

Evaluation Ego	Evaluation Alter	Reciprocity	Mean (*SD*)	Percentage of Total Mean
(No tie)	(No tie)	No tie	31.80 (32.64)	76.80
Close	Close	Balanced (same closeness evaluation)	2.02 (1.49)	4.88
Less close	Less close		0.77 (1.00)	1.87
Close	Less close	Unbalanced and ego evaluates as closer	0.62 (0.89)	1.51
Close	(No tie)		0.93 (1.21)	2.25
Less close	(No tie)		1.85 (1.72)	4.47
Less close	Close	Unbalanced and alter evaluates as closer	0.62 (0.88)	1.51
(No tie)	Close		0.93 (1.24)	2.25
(No tie)	Less close		1.85 (1.94)	4.47
Total				100

Note. $n = 1{,}229$.

The networks of Facebook connections and social relationships were reconstructed based on nominations. On average, the respondents had 40 Facebook connections within their own grade ($M = 41.40$, $SD = 35.09$). Half of the students had fewer than 32 connections ($Mdn = 32$), and less than 5% had more than 130 same-grade connections. In total, 47.5% of the Facebook connections were mutually indicated. With regard to friendship relationships, on average, the respondents nominated four to five best friends (close friendship) and a similar number of peers who were "just friends" (less close friendship; $M = 4.41$, $SD = 2.29$ and $M = 4.43$, $SD = 2.37$, respectively). For close friendships, 35.91% of the friendship pairs were reciprocated; for friendships that were less close, the proportion was 12.88%. Additionally, if friendship types of any strength are considered, 38.15% of the pairs nominated each other as friends. The aforementioned friendship networks were used to determine the underlying strength of the Facebook connections; this classification is shown in Table 3. The first category of Facebook connections—and by far the most frequent—was connections in which neither of the actors indicated a friendship relationship ($M = 31.80$, $SD = 32.64$). The second category consisted of balanced ties that were mutually evaluated as close or less close. On average, each respondent had two Facebook connections that were considered mutually close friendships ($M = 2.02$, $SD = 1.49$). Slightly less common were Facebook ties that were mutually evaluated as less close ($M = 0.77$, $SD = 1.00$). The third category included Facebook connections that were unbalanced (i.e., they were not reciprocated or not evaluated as equally close). In this category, most ties were based on social relationships that were evaluated as "less close" by one actor, whereas the other actor indicated no tie ($M = 1.85$, $SD = 1.72$ [for the alter indicating no tie], $SD = 1.94$ [for the ego indicating no tie]). A lower number of unbalanced ties was found in which one user claimed a close relationship while the other considered it nonexistent ($M = 0.93$, $SD = 1.21$ [for the alter indicating no tie], $SD = 1.24$ [for the ego indicating no tie]). The remaining type of unbalanced Facebook connections comprised those in which both actors acknowledged a relationship, but one deemed it close, whereas the other reported it as "less close." On average, the respondents had fewer than one of these ties among their Facebook friends ($M = 0.62$, $SD = 0.89$ [for the alter indicating a tie that was less close], $SD = 0.88$ [for the ego indicating a tie that was less close]).

The Facebook Ties of Victims and Perpetrators

Logistic regression analyses were employed to relate the number of Facebook ties (of different strengths) to victimization. Regarding unbalanced ties, Table 4 (middle section) indicates that having more Facebook connections based on ties that are considered less close by the respondent and nonexistent by the alter (i.e., less close–no tie) increase the likelihood of receiving rude messages,

Table 4. Victimization of Two Types of Harassment and Bullying as Predicted by the Number of Different Facebook Ties.

Tie Evaluation			Rude Messages			Nasty Comments			Bullying		
Ego	Alter	Balance	β	*SE*	Odds Ratio	β	*SE*	Odds ratio	β	*SE*	Odds Ratio
(No tie)	(No tie)	No tie	.009	0.004	1.01*	.012	0.004	1.01**	.007	0.005	1.01
Close	Close	Balanced	.192	0.085	1.21*	.054	0.095	1.06	.007	0.109	1.01
Less close	Less close		.228	0.121	1.26	−.060	0.157	0.94	−.074	0.175	0.93
Close	Less close	Unbalanced and ego evaluates as closer	−.356	0.176	0.70*	−.507	0.216	0.60*	−.152	0.189	0.86
Close	(No tie)		.169	0.103	1.18	−.176	0.136	0.84	−.054	0.132	0.95
Less close	(No tie)		.201	0.078	1.22*	.209	0.082	1.23*	.216	0.088	1.24**
Less close	Close	Unbalanced and alter evaluates as closer	.115	0.145	1.12	.120	0.158	1.13	.054	0.188	1.06
(No tie)	Close		.017	0.099	1.02	−.116	0.129	0.89	.000	0.135	1.00
(No tie)	Less close		.099	0.060	1.10	.006	0.075	1.01	−.124	0.100	0.88
Constant			−4.67	0.387	1.10***	−3.69	0.361	0.025***	−3.65	0.381	0.03***
Nagelkerke R^2			.121			.079			.033		

Note. $n = 1{,}229$.

being subjected to malicious comments, and being bullied on Facebook, which is consistent with Hypothesis 1a. In contrast, having more ties that the ego evaluates as close and the alter considers less close (close–less close) decreases the likelihood of receiving rude messages or hurtful comments, which is inconsistent with Hypothesis 1a. The bottom section in Table 4 refers to unbalanced ties, which the respondent evaluates as less close, and illustrates that the number of such ties in any of the three configurations (less close–close, no tie–close, and no tie–less close) was not related to victimization. Therefore, Hypothesis 2a could not be confirmed.

For Facebook ties that are based on balanced relationships, Table 4 (upper section) indicates that Facebook ties reciprocally evaluated as close or less close were not related to victimization by hurtful comments or bullying, except for the unexpected finding that more mutual close friendships on Facebook increased the likelihood of receiving rude private messages. Hence, no supporting evidence was found for Hypotheses 3a and 5a. Additionally, more connections that exist only on Facebook increased the likelihood of receiving rude messages and malicious comments, which is consistent with Hypothesis 4a.

A similar analysis was performed to determine which types of Facebook ties are related to the perpetration of aggressive behavior. Table 5 (middle section) indicates that unbalanced ties that the ego evaluates as closer were generally not related to being an offender. Therefore, the negative association that was presumed in Hypothesis 1b could not be confirmed. However, there was a positive relationship between bullying and the number of Facebook ties that the respondents rated as less close but that were not acknowledged by the other actors (less close–no tie).

For unbalanced ties that the respondent evaluated as less close (Table 5, lower section), the analyses indicated that a higher number of Facebook connections that the ego evaluates as less close and the alter evaluates as close (less close–close) are related to an increased likelihood of posting malicious comments on pictures or messages. The presence of more Facebook ties that the ego does not perceive as friendship relationships but the alter evaluates as less close (no tie–less close) is associated with an increased likelihood of involvement in sending malicious private messages and bullying on Facebook. These findings are consistent with Hypothesis 2b.

Regarding balanced ties that are mutually perceived as close or less close, no significant relationships were found. Thus, Hypothesis 3b was not supported. However, the results (Table 5, upper section) indicate that the presence of Facebook connections without underlying friendships (no tie–no tie) is associated with a higher likelihood of perpetration. This finding applies to sending rude private messages, posting malicious comments on pictures and messages, and bullying. Thus, Hypothesis 4b is supported.

Discussion

Despite the many opportunities that social network sites offer to young people, these sites can also be used to commit hurtful behaviors toward one's peers (Lenhart et al., 2011; Ybarra & Mitchell, 2008). This article addressed the topic of aggressive behavior on social network sites and focused on a central component of these platforms: the networks of connections that young people construct. It was argued that not only the number of online connections (Kwan & Skoric, 2013) but also the strength of these friendship ties affects young people's involvement in harassment and bullying. More specifically, the literature suggested that weak friendship ties and unbalanced ties are associated with aggressive interactions (Faris & Ennett, 2012; Pellegrini & Long, 2002). This article explored whether such patterns also exist in the context of online social ties and online instances of aggression. For this purpose, the Facebook connections and friendship ties among eighth-grade students were mapped in 11 secondary schools. Overall, it was shown that having more connections on Facebook increased the likelihood of involvement in cyberaggression. In addition, this study found that the strength of online ties affected involvement in cyberaggressive behavior.

Table 5. Perpetration of Two Types of Harassment and Bullying as Predicted by the Number of Different Facebook Ties.

Tie Evaluation			Rude Messages			Nasty Comments			Bullying		
Ego	Alter	Balance	β	*SE*	Odds Ratio	β	*SE*	Odds Ratio	β	*SE*	Odds Ratio
(No tie)	(No tie)	No tie	.010	0.003	1.01**	.010	0.004	1.01**	.008	0.004	1.01*
Close	Close	Balanced	.152	0.083	1.16	.069	0.091	1.07	.062	0.098	1.06
Less close	Less close		.163	0.117	1.18	.034	0.138	1.04	−.009	0.152	0.99
Close	Less close	Unbalanced and ego	.118	0.131	1.13	.007	0.156	1.01	.205	0.145	1.23
Close	(No tie)	evaluates as closer	.164	0.101	1.18	.000	0.126	1.00	.089	0.120	1.09
Less close	(No tie)		.136	0.075	1.15	−.040	0.089	0.96	.218	0.086	1.24*
Less close	Close	Unbalanced and alter	.121	0.138	1.13	.374	0.127	1.45**	.209	0.157	1.23
(No tie)	Close	evaluates as closer	.078	0.091	1.08	.120	0.095	1.13	.017	0.113	1.02
(No tie)	Less close		.115	0.057	1.12*	.059	0.064	1.06	.132	0.064	1.14*
Constant			−4.68	0.371	0.01***	−4.11	0.362	0.02***	−4.82	0.426	0.01***
Nagelkerke R^2			.115			.081			.093		

Note. $n = 1{,}229$.

The presence of same-grade Facebook connections that were not supported by underlying friendships was shown to increase the likelihood of involvement in aggressive actions on Facebook. Exposure to and interaction with Facebook-only connections (i.e., fellow-grade students who are connected on Facebook but who are not friends at school) increased the risk of falling victim to harassment. Perpetrators may find the ideal target in fellow students with whom they have no relationship to avoid the possibility that such students are connected to the perpetrators' friends (Veenstra et al., 2010). Moreover, the interpretation of the receiver could also be a relevant factor. Individuals who are part of different social groups can have different sets of interactional norms (O'Sullivan & Flanagin, 2003) and may interpret some messages as hurtful even if they were intended differently. The perpetration of cyberaggression is also associated with a larger number of Facebook-only connections. First, this may be associated with the perpetrators' intensive use of social network sites in general (Kwan & Skoric, 2013). Second, many adolescents may want to be ''Facebook friends'' with the popular students at school, who are also more likely to be offenders (Juvonen, Graham, & Schuster, 2003; Sijtsema et al., 2009). Perpetrators may accept these friendship requests because they are motivated by the status that is associated with having an extended list of connections on Facebook (Tong et al., 2008).

For close friendships on Facebook, the hypothesized outcome was not found. Being connected with (mutually acknowledged) best friends on Facebook did not protect adolescents from cyberaggression. In contrast, the presence of a large number of such connections increased the likelihood of receiving rude private messages from fellow-grade members. This finding may be explained by considering that conflicts and fights are not uncommon among friends (Hartup & French, 1993; Kowalski & Limber, 2007; Mishna, Wiener, & Pepler, 2008) and that confrontational messages can be interpreted as ruder in online communications than in face-to-face interaction because of the lack of contextual cues in online conversations (Kowalski, Limber, & Agatston, 2008). The fact that these disagreements occur in private messages rather than in public could indicate that young friends tend to solve their conflicts among themselves. With regard to perpetration, the presence of mutual, close ties on Facebook did not decrease harassment or bullying. Adolescents who are involved in aggressive behavior may still have close relationships at school (and on Facebook), which may support them in their online aggression. Prior research has found that perpetrators can act nicely to a set of intimate friends while directing hostile behavior toward the out-group (Champion et al., 2003; Grotpeter & Crick, 1996). In addition, disturbing behavior on Facebook may be passed on to others; mutual friends have proven particularly influential (Fujimoto & Valente, 2012).

In terms of the influence of unbalanced Facebook connections on cyberaggression, the results are mixed. The presence of unbalanced ties increased the risk of victimization, but only for one particular type of online connection. Victims tended to have more online contacts that they rated as moderately close, whereas their connections did not acknowledge these friendships. The same type of unbalanced Facebook ties predicted involvement in perpetration as well. As expected, perpetrators had a higher number of online ties in which they did not reciprocate the underlying (weak) friendship. This evidence is in line with the idea that unbalanced social ties suggest a difference in social status (Ball & Newman, 2013), which is associated with harassment and bullying behavior (Olthof et al., 2011; Salmivalli & Isaacs, 2005).[1] Adolescents who are higher in the peer hierarchy may have ample opportunities to target lower status peers, as predicted by social dominance theory (Mouttapa et al., 2004). However, this pattern was not demonstrated for many other types of unbalanced Facebook ties. Most notably, unbalanced ties were not associated with reduced victimization or perpetration in cases where this pattern was hypothesized. For instance, the likelihood of victimization was not lowered by the presence of many Facebook connections who claimed friendship although the respondent did not. Instead, unbalanced Facebook ties mainly predict *increased* risks of involvement in cyberaggression and only when respondents indicate unreciprocated weaker friendship ties. Furthermore, the presence of ties that were reciprocated but not evaluated as equally close (''best

friend" vs. "just a friend") was unrelated to the predicted outcomes. This finding suggests that the disparity in evaluated closeness may not capture true differences in hierarchical position.

In this regard, an unexpected association was found. The likelihood of harassment on Facebook *decreased* for respondents with many same-grade connections that were close in their own eyes, even when the other party evaluated the relationship as less close. Two explanations can be given for this finding. First, the interpretation of aggressive behavior may depend on adolescents' social relationship. Close friends, for instance, can address one another with hostile or vulgar words as a form of play, although the use of such language would be hurtful in other contexts (O'Sullivan & Flanagin, 2003). In this case, some adolescents may not interpret aggressive messages as intentionally hurtful because they feel that they have a close relationship with the senders of these messages. Second, the result may imply that the perception of social support in having a close friend protects adolescents from victimization, as Williams and Guerra (2007) have found, and that it is perhaps less important whether a friend recognizes a similar level of closeness.

From the present results, several recommendations can be derived for young Facebook users. Adolescents who are unpopular or victimized at school may want to compensate for their poor offline situation by creating many Facebook connections (Zywica & Danowski, 2008). However, the current study shows that this strategy is counterproductive. Exposure to many Facebook-only ties and online connections who deny a relationship increases the risk of online aggression. These unbalanced ties are detrimental because one party mistakenly assumes that he or she is addressing a "friend." Any personal information that is shared with this assumed friend can be used against the victim as a form of *backstabbing* (Boyd, 2006). A more fruitful strategy may be to select Facebook friends more carefully. The findings suggest that adolescents would be in a better position if they connect to peers who already accept them at school and with whom they already feel close, even if these others do not consider them their best friends. Facebook friends who are in a slightly better social position are able to offer protection against victimization because defending is generally associated with higher social status (Sainio, Veenstra, Huitsing, & Salmivalli, 2011). The mutual close friends of unpopular adolescents may be equally low in the social hierarchy and may therefore be unable to defend their friends.

A second practical implication of this study is the recognition of potential risk factors in the Facebook profiles of adolescents. A high number of Facebook connections can be a warning sign of involvement in cyberaggression, particularly when these connections are not based on everyday friendships. Perpetrators may have many Facebook contacts who want to associate with them but who are clearly not their friends in the school context. Victims may also have many Facebook connections, but victims overestimate the strength of these ties. Parents can obtain insight into these networks and the quality of the online ties by actively engaging in young people's activities on Facebook. This can be particularly useful for young people who have previously been involved in harassment or bullying. Although it may be difficult for parents to judge the exact nature of Facebook ties, it is advisable to practice this type of active parental mediation because it has proven most effective (Duerager & Livingstone, 2012; Mesch, 2009).

Notwithstanding the results and their implications, some limitations are present in the current study. Because the analyses were based on a cross-sectional measurement, no conclusions can be drawn regarding the direction of the relationships. For instance, adolescents may commit aggressive acts because they have many online connections that they rate low in terms of closeness, or they may attract such connections as a result of their aggressive behavior. Future research could elaborate on the evolution of adolescents' online ties in relation to cyberaggression over time. Another limitation relates to the boundaries that were established. Because the population was restricted to a single-school grade, friendship relationships (and Facebook connections) from outside of school were not included in the analyses. Nevertheless, young people's relationships in other contexts may affect their likelihood of being a victim or perpetrator. Therefore, the association between having certain

Facebook connections and being involved in cyberaggression cannot be generalized to the social environment outside of school. In addition to the boundaries that were set for the online social network, this study is limited by its reliance on the respondents to recall their connections on Facebook. Although the students were prompted by a reference list of all grade members, they may not have remembered exactly to whom they were connected on Facebook. Future studies could explore the possibility of collecting these data in a more automated fashion or enabling students to log in to the social network site to check their friend list. Furthermore, based on prior research, we adopted the principle that unbalanced friendships may entail social status differences. Although this perspective was useful for interpretation, we acknowledge that there could be other explanations of differences in friendship evaluations, such as different ideas about what constitutes friendship. Additionally, although differences in the evaluated closeness of Facebook ties were found to be related to perpetration and victimization, the present research did not elaborate on who was targeted by whom. Future studies could focus on this aspect and investigate, for instance, whether adolescents who overestimate the closeness of their online ties are targeted by individuals who are on the receiving end of such ties. Finally, future research could also incorporate other features of the (online) social network structure on different levels, such as overall density, network centralization, and cohesive subgroups.

In sum, this study contributes to research on cyberaggression by focusing on adolescent students' networks of connections and the differences in tie strength among these connections. Methodologically, the results were obtained by (1) considering the underlying social relationships of connections on a social network site and (2) combining the perspectives of closeness and reciprocity as a measurement of tie strength. This approach allowed for an elaborate analysis of the connections on a social network site, which are known to be diverse (Vitak et al., 2011). In the context of a school environment, it was demonstrated that Facebook-only connections and weak, unbalanced online ties are related to cyberaggressive behavior. Future research on the risks and opportunities presented by social network sites could consider the diversity of online connections and focus on the impact of specific types of online ties.

Appendix A

Friendship nomination items

In this part, I ask you to write down the names of other students from your own grade. For each student, write the first and last name, and do not give more names than the number of lines that are provided. You can look up the correct first and last names in the list that you received.

1. Best friends are people you hang out with a lot, whom you talk about very personal things with, and whom you can count on. Who are your best friends at school in your own grade?

First name	Last name	First name	Last name
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

2. Others who are just friends are people whom you regularly hang out with and chat with (but less often than with your best friends and less about really personal things). Who are you just friends with at school in your own grade?

First name	Last name	First name	Last name
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

Appendix B

Cyberbullying

We speak of bullying when

- people do or say mean or hurtful things
- the bully has the intention to make others feel bad
- the person being bullied has difficulties defending himself or herself

Therefore, it is not bullying when friends tease each other or have an argument.

Bullying can also take place through electronic media, such as the internet or mobile phone. A bully can, for instance, send mean text messages, post insulting responses on Facebook, say things that are not pleasant via MSN, or spread hurtful pictures via a website. The following question is ONLY about bullying via the internet or mobile phone.

21. How often were you bullied through the internet or mobile phone in the last six months?

○ never (go to question 26)

○ once during the last six months

○ several times during the last six months

○ once a month

○ several times a month

22. How were you bullied through the internet or mobile phone? *(you can select multiple answers)*

□ hurtful messages were sent to me (such as texts, pictures, or videos)

□ hurtful messages about me were sent to others

□ no messages were sent, but something was done that was not pleasant,

which was: ..... *(write it down)*

□ I was excluded

23. Who has bullied you through the internet or mobile phone? *(you can select multiple answers)*

□ student(s) from my school, from my grade

□ student(s) from my school, from a different grade

□ other(s) from outside school who I meet in real life

□ other(s) who I know only from the internet

□ other(s) who are unknown

24. If you were bullied through the internet or mobile phone by students from your own grade, who were they? Also indicate what application was used and how frequently that student has bullied you. *(you can select multiple applications for each person, select one option when asked "how often")*

First and last name of the student	Application				How often has that student bullied you through the application(s)			
	texting	MSN	Face-book	other	once	several times	once a month	several times a month
.....	□	□	□	□	○	○	○	○
.....	□	□	□	□	○	○	○	○
.....	□	□	□	□	○	○	○	○
.....	□	□	□	□	○	○	○	○

Appendix C

Facebook connections

42. Do you have a Facebook profile?

○ no (go to question 51)

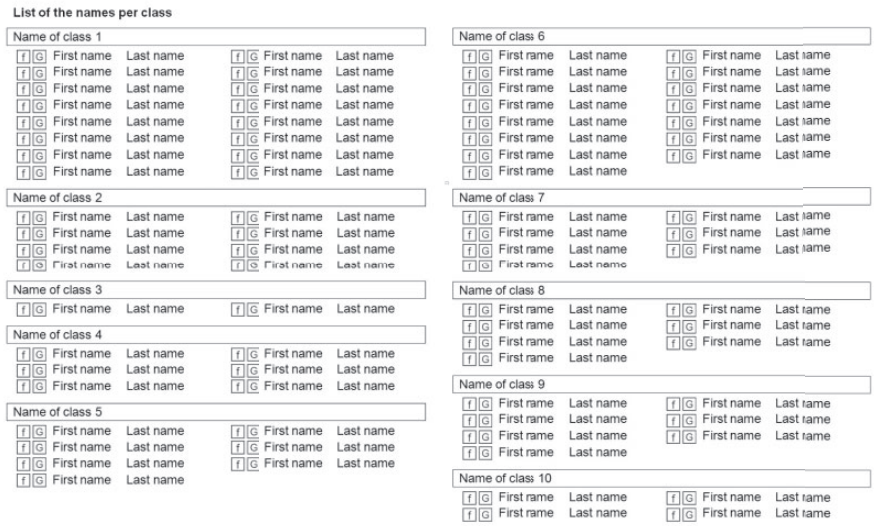
○ yes

[four questions were omitted because they are not part of the present study]

47. On the separate sheet with names, there is a box with the letter "f" in front of each student from your grade. It looks like this: [f]

Check the boxes of all students you are <u>friends with on Facebook</u>. *(later, hand in this separate sheet together with the questionnaire!)*

[below is an example of a reference sheet with the names and classes anonymized]



Appendix D

Cyber-harassment through Facebook

50. Which students have done the following things in the last six months? *(indicate if students from your grade did this and fill in their names if you selected "yes")*

	Someone from my grade did this		If students from your grade did this, who were they?	
	no	yes	First name	Last name
Said something rude to me through a private message on Facebook	○	○	.....	.....
			.....	.....
			.....	.....
Excluded me from a Facebook group or removed me as a friend	○	○	.....	.....
			.....	.....
			.....	.....
Posted a comment that wasn't nice on my pictures or messages on Facebook	○	○	.....	.....
			.....	.....
			.....	.....
Placed things on my "wall" that were not nice at all	○	○	.....	.....
			.....	.....
			.....	.....
Placed a picture of me on Facebook and wrote mean things next to it	○	○	.....	.....
			.....	.....
			.....	.....

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Note

1. From a different perspective, one could wonder why perpetrators would befriend lower status peers on Facebook rather than students with the same (or even higher) status. The explanation may lie in the perpetrator's need for popularity. Having many connections on Facebook generally adds to their perceived popularity (Zywica & Danowski, 2008). Being perceived as popular is an indication of high social status, which is a primary motivator of perpetration in the first place (Sijtsema, Veenstra, Lindenberg, & Salmivalli, 2009).

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